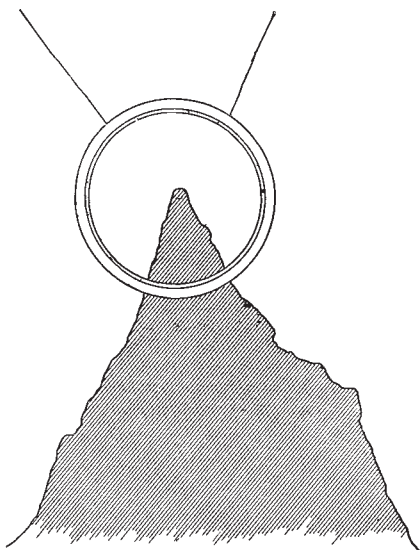


shadow, and we saw a circular rainbow of perhaps 8° or 10° diameter surrounding the shadow of the summit, and as we waved our arms we saw the shadow of our limbs moving in the mist. Two dark lines seemed to radiate from the centre of the bow, almost in a prolongation of the slopes of the Peak, as in the figure.

Twice this shadow appeared and vanished as cloud obscured the sun, but the third time we saw what has apparently struck so many observers. The shadow seemed to rise up and stand in front of us in the air, with rainbow and spectral arms, and then to fall down suddenly to the earth as the bow disappeared. The cause of the whole was obvious. As a mass of vapour drove across the shadow, the condensed particles caught the shadow, and in this case were also large enough to form a bow. As the vapour blew past, the shadow fell to its natural level—the surface of the earth.

An hour later, when the sun was well up, we again saw the shadow of the Peak and ourselves, this time encircled by a



Shadow, circular rainbow, and dark radiating lines of Adam's Peak.

double bow. Then the shadow was so far down that there was no illusion of standing up in front of us.

I believe that the formation of fog-bow and spectral figures on Adam's Peak is not so common as the simple rising up of the shadow, but one is only a development of the other. In fine weather, when the condensed vapour is thin and the component globules small, there is only enough matter in the air to reflect the Peak shadow in front of the spectator, and no figure is seen unless the arms are waved. In worse weather the globules of mist are large enough to form one or two bows, according to the intensity of the light. We were fortunate to see the lifted shadow accompanied by fog phenomena, which left no doubt as to the cause of the whole appearance.

Any idea of mirage was entirely disproved by my thermometric observations, which cannot be detailed here for want of space.

RALPH ABERCROMBY

Colombo, February 25

"Bishop's Ring"

THE critique on Dr. Riggenbach's pamphlet on the Krakatã dust-glow alludes to the peculiar ring since seen surrounding the sun, and known as "Bishop's Ring," as though it had ceased to be visible last year. But the peculiar pink-tinged area surrounding the sun has been constantly seen since then, though perhaps without so definite a succession of tints as to deserve the title of "halo." On almost any day when the sun is hidden by a dense cloud so that the direct light is greatly subdued, there will appear, surrounding the cloud, an area at first intensely white, and then passing into a definite pink tinge. I saw this phenomenon very markedly this afternoon at 5.10 p.m., when walking across the fields from Swinggate, a hamlet between here and Dover, towards the Cornhill Coastguard Station,

I have always observed it better when there is a strong south-west wind blowing. Does this mean that the great mass of the dust-particles is still in equatorial regions? Though the phenomenon to which I allude is undoubtedly best seen when the sky has that gray tinge which accompanies a saturated or super-saturated condition, I can hardly think it due to moisture. I did not observe it till after the Krakatã eruption, and I have observed it constantly since that outbreak. Perhaps condensation of moisture in the upper aerial regions may result in the formation of minute particles of water to which the dust-particles become attached, and thus both water and dust may be concerned in the production of the pink-tinged area. EDWARD F. TAYLOR

St. Margaret's-at-Cliffe, Dover, March 29

"Ferocity of Rats"

IN reference to the correspondence that appeared in last week's issue (p. 513) upon the above subject, permit me to state I have found by practical experience that the ferocity and voracity of rats is very great. They devour one another at all times and under all circumstances, whether living in a wild state or under the influence of domestication. I kept six rats at one time in confinement, and although well fed, the largest specimen consumed all the rest. Again, shortly after the late Inventions Exhibition closed last year, the following incident came under my notice, which fully confirms me in the belief I have expressed. As I was passing through the building I heard wild and piteous cries issuing from a spot close to where I stood. I immediately proceeded thence, and beheld six large rats feasting upon three of their congeners not much smaller than themselves, who were endeavouring to free themselves from the sharp teeth of their assailants. All of these rodents appeared thin and wild, and were no doubt rendered bold and desperate by privation, for my presence had no effect upon their carnivorous attacks. I frequently hear rats scampering beneath the floor of my office, accompanied by loud and protracted squeals; and, after what I saw, I am induced to believe that a deadly raid is on such occasions being made upon one or more of them.

W. AUGUST CARTER

The Claylands, South Norwood, April 5

Weather in South Australia.—Stevenson's Thermometer-Screen

LATELY the conditions of weather on the Adelaide Plains have been so very interesting to the English meteorologist that a few figures may doubtless be acceptable to readers of NATURE. On February 18 the shade-maximum temperature at this observatory was 105.5 during a barometric depression. This was followed by a minimum of 48.7 accompanying a barometric crest on the morning of the 21st, a range of 56.8 within three days. Again, at 3 p.m. on the 18th the dry bulb read 105.5 , and wet bulb 69.1 , giving the extraordinary difference of 36.4 . These figures actually give 9 as the percentage of relative humidity, according to Guyot. The instruments are exposed in an enlarged Stevenson screen, which answers admirably in this climate; and what can be a better test? I may add that I also have a small "Stevenson," of the pattern usually employed in England, with duplicate instruments. The differences between the two usually amount to merely a few tenths of a degree. The Hon. Ralph Abercromby, who visited my observatory a short while ago—since my return from Queensland—was much pleased with the result of my comparison. I reserve a table for the Royal Meteorological Society, but I may mention that I claim to have proved that Mr. Stevenson's screen is in every way suitable for the hot and dry climate of this continent. I am strongly of opinion that this screen, in its enlarged form, should henceforth be universally employed to secure *uniformity* of exposure—a desideratum of the very highest importance. I have strongly recommended its adoption throughout Queensland. I have found no trace of undue heating of the internal louvres, even under temperatures over 100° .

CLEMENT L. WRAGGE

Torrens Observatory, near Adelaide, South Australia,
March 1

"Radicle" or "Radical"

MAY I utter a word of protest against a common, but (as I venture to think) erroneous way of spelling the above word

when used in its ordinary chemical sense of a root (Latin, *radicula*), basis, or common ingredient of a series of chemical compounds?

Surely the word is a substantive, and, like similar derivatives, should be spelt "radicle," and not as the adjective "radical." I hope, however, that those who spell it in the latter way will be able to adduce a partical of reasoning in favour of their practice.

I am quite aware of the existence of a "leading article" called a "Radical" in politics; but in this case there is reference to one who desires a "radical" change in existing institutions. If, however, we are to consider him as "a common ingredient in a series of Caucuses," then I should maintain that here also the spelling should be amended. H. G. MADAN

Eton College, April 5

An Earthquake Invention

REFERRING to Prof. Milne's letter in NATURE of March 11 (p. 438), I have to say:—(1) That what I, as representing my father, have to complain of is that in a British Association Committee's Report describing experiments made with an aseismic arrangement, and which appeared in the *Transactions* of the British Association of 1884, the writer thereof, who appears to have been Prof. Milne alone, did not acknowledge that Mr. David Stevenson had invented, described, and constructed precisely such apparatus in 1868, facts which Prof. Milne cannot deny, and yet took the honour to himself; and, when this was pointed out, he then set up a claim for Mr. Mallet which Mr. Mallet assuredly never made, and would have been the first to repudiate.

(2) Prof. Milne in that Report praised the aseismic joint as a most useful invention, introducing a new and valuable principle of construction for earthquake-affected countries, and though he may now think otherwise, yet the account given in the Tsugisaki light-keeper's letter, quoted by him, of the effects of a shock at that lighthouse, in place of showing the uselessness of the apparatus, in my opinion proves the reverse, as the shock is reported to have been very severe; and had there been no aseismic joint under the illuminating apparatus, it would have been so seriously damaged as to have been rendered useless, in place of which the light was only extinguished for five minutes.

Mr. Stevenson, in his original paper, with characteristic caution, carefully calls it an apparatus to *mitigate the effect of earthquake shocks*. Mr. Kinjoro Fugicura, Engineer in Chief to the Lighthouse Department of Japan, writing January 11, 1886, says he is unable at present to give any definite opinion as to the merits of the aseismic arrangements, because, since he put them in operation when he became Engineer in Chief, the occurrence of earthquakes has been very rare indeed; and further, he is of opinion that really to get at the bottom of the matter, two experimental tables would have to be placed at the same locality side by side, one with the aseismic arrangements, and the other fixed, so that the behaviour of the two tables might be directly compared. To which I might add that the whole lighthouse (or any building of equal size), like that constructed and sent to Japan by my father, but which was unfortunately lost at sea, should be rebuilt and tried against ordinary houses unprovided with my father's invention.

(3) Prof. Milne asks what I claim as coming under Mr. Stevenson's invention. I claim of course everything which employs the same principle, and most distinctly the house carried on shot or "cast-iron sand," as Prof. Milne calls it, and which he lately erected in Japan, as well as the building described by him in the B. A. Report, p. 248, for 1884, as "resting on four cast-iron balls," and the action of which has been so perfect as to have actually "destroyed" all the "sudden motion or shock," and recorded by him as a notable earthquake.

I will not further trespass on your space, but refer your readers to the former correspondence on this subject in NATURE.

D. A. STEVENSON

84, George Street, Edinburgh, March 22

DR. T. SPENCER COBBOLD, F.R.S., F.L.S.

DR. COBBOLD was the son of the Rev. Richard Cobbold of Wortham in Suffolk. He was born in 1828, and educated at Charterhouse. He matriculated

at the University of Edinburgh in November 1847, after having, in accordance with the mode of preparation for the profession of medicine then regarded as most advantageous, served a three years' apprenticeship with Mr. Crosse of Norwich, one of the most eminent and distinguished surgeons of his time. He thus came up to the University provided with a large amount of practical information, and even as a first year student possessed great dexterity in dissection and in the making of museum preparations, and was a skilful draughtsman. After working diligently for a year under Prof. Goodsir, he was appointed by that great anatomist as his prosector, and under his influence was led to abandon practical medicine for the more attractive study of morphology; his first original research being an anatomical essay on the Canal of Petit, which he offered as his graduation thesis, and for which a gold medal was awarded him by the Medical Faculty.

Like all other earnest Edinburgh students of that time he took an active part in the debates of the Royal Medical Society, and became in 1852 its senior President. In the same year, not many months after his graduation, he was appointed Curator of the Anatomical Museum, and became a prominent leader in the biological work of the School. As Curator he gave lectures on comparative osteology, and added largely to the collections. He also worked out the material for his article "Ruminantia," which appeared in the "Cyclopædia of Anatomy and Physiology" in 1856.

In 1856 Dr. Cobbold removed to London, and soon afterwards began to devote himself to the study of animal parasites, and particularly to the experimental investigation of their life-history, on which subject he made during the following years a number of important communications to the Linnean and other Societies. In 1864 his well-known work on "Helminthology" appeared, to which in 1869 he added a supplement containing his later researches. He subsequently published a manual of the parasitic diseases of domestic animals, a work on the grouse disease, and various other works relating to diseases of the same class.

In 1868 he was appointed by the Trustees of the British Museum to the Swiney Professorship of Geology, to which subject he had been led, under the influence of Prof. Edward Forbes, to devote much attention during his residence in Edinburgh. The greater number of these lectures were given at the Royal School of Mines, and were largely attended.

Dr. Cobbold's reputation as a comparative pathologist will rest on his treatise on the Entozoa. His most important contributions to morphology are his article on Ruminantia, his experimental researches on *Tænia mediocanellata* and other Cestodes, on Trichina, and on *Distoma hæmatobium*, and his recent paper on the parasites of elephants. His last communication to the Linnean Society was read on March 4.

THE GEOLOGISTS' ASSOCIATION AT THE SCIENCE SCHOOLS

ON Saturday, March 20, a party of over a hundred members of the Geologists' Association visited the Science Schools at South Kensington, by permission of the Science and Art Department, and were conducted over the building by Prof. J. W. Judd, F.R.S. The visitors met in the entrance-hall at 2.30, and then seated themselves in the large Chemical Lecture Theatre, where Prof. Judd gave a sketch of the history and development of the Schools and of the methods of study therein followed. At the conclusion of this address the party walked slowly through the various laboratories and lecture-rooms—metallurgical, physical, and chemical—gradually ascending to the upper stories of the lofty building, where are situated the biological and geological rooms. In one of